

# **Southwest Solar Barn Raising Program**

## **Work Plan**

### **I. Project Title and Project Purpose Statement**

**Project Title:** Southwest Solar Barn Raising Program: Improving Climate Resiliency through Solar Installations for Low-Income Households

#### **Purpose Statement**

The proposed project seeks to educate low-income residents of La Plata County, Colorado on solar photovoltaics (PV) and provide them with access to affordable solar PV system installations. The Four Corners Office for Resource Efficiency (4CORE) will facilitate a ‘barn-raising’ model to garner volunteers and sponsors to assist in the installation of the solar PV systems, a task greatly economized by neighbors helping neighbors. This model includes educating area families and individuals on solar installation practices and benefits, and ensuring a volunteer pool is available for future low-income household solar installations in part by the implicit commitment from system recipients to ‘pay it forward’ in future volunteer service.

Solar installations on low-income households and educational community events will take place throughout La Plata County, Colorado potentially including homes in the towns of Bayfield, Ignacio, and Durango, and zip codes 81301, 81302, 81303, 81326, 81137 and 81122.

The project will include activities directly related to the Clean Air Act, Section 103(b)(3): conduct research, investigations, experiments, demonstration projects, surveys, and studies related to the causes, effects, extent, prevention, and control of air pollution. These activities also directly support EPA’s Strategic Plan Goal 3: “Cleaning Up Communities and Advancing Sustainable Development”, as well as EPA’s Cross-Agency Strategy to “make a visible difference in Communities.”

The proposed project plays a critical role in the community’s climate resiliency by addressing vulnerabilities to low income households from climate change consequences. The climate resiliency focus of the project centers on avoiding, lessening, and delaying the risks associated with climate change and the accompanying impacts to low income families, through reducing demand for fossil fuel generated electricity and thus, the cost of higher utility bills associated with increased heating and cooling loads. These increased loads are likely to occur as a result of associated temperature extremes during the summer and winter months, resulting from environmental stresses. The barn raising model, developed alongside educational strategies, will have lasting and duplicative effects into the future, demonstrating methodologies to perpetuate community climate resiliency.

### **II. Environmental, Public Health and Community Climate Resiliency (if applicable) information about the Affected Community**

Southwest Colorado is primarily rural, with Durango, (16,887 pop., in La Plata County) and Cortez (8,482 pop., in Montezuma County) containing the highest populations. The geographic area encompasses 6,584 square miles and includes a population of over 91,000 residents, approximately 14 people per square mile.

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Two coal-fired power plants in northern New Mexico, the San Juan Generating Station and the Four Corners Power Plant, two of the most polluting power plants in the United States, generate power with harmful byproducts, emitting over 25 million tons of carbon dioxide, sulfur dioxide, nitrogen oxide, soot, and mercury every year. These emissions cause chronic respiratory health issues for residents, diminish air quality for one million visitors to the region each year, and contribute to greenhouse gases, and climate change<sup>1</sup>. Though plans are in the works for decreasing production from these plants, further reductions in demand are critical to combating climate change.

Southwest Colorado was recently identified as a ‘hot spot’ for producing the largest concentration of the methane seen over the United States – more than triple the standard ground-based estimate -- according to a new study of satellite data by scientists at NASA and the University of Michigan<sup>2</sup>.

While demand for electricity generated by coal and natural gas continues, abundant sunlight (over 290 days per year) shines in Southwest Colorado’s affected communities, creating enormous potential for climate resilient methods that provide homes and businesses with clean solar generated electricity. By capitalizing on the solar potential of the region, this project will reduce demand for fossil fuel generated electricity, resulting in fewer greenhouse gas emissions from the regional power plants in northern New Mexico.

In La Plata County, solar PV has traditionally been viewed as an accessory for high income households. The upfront capital to install rooftop solar has not been available to low-income residents as paying for basic necessities, including monthly utility bills, has trumped any notion of solar. Even with the availability of below market financing provided through the Solarize La Plata Program, only nine out of 101 contracted system installations took advantage of loans. This is demonstrative of the perception that solar is only attainable for mid- to high-income households.

Southwest Colorado as a whole has a high percentage of low-income residents, poor housing stock, and an extended heating season. Per capita income in four of the five counties falls below the state average, and the five-county average percentage of persons living below the federal poverty level is 12.9%, higher than the state average of 12.2%. While 11% of La Plata County residents have incomes below the Federal Poverty Level, 4CORE defines low-income as at or below 200% of the Federal Poverty Level due to the higher cost of housing in this region.<sup>3</sup> It costs nearly three times the Federal Poverty Level to meet the basic needs of a two-parent family with an infant and a preschooler in La Plata County, one of the most expensive counties in

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<sup>1</sup> Area visitors approximated from Durango and Silverton Narrow Gauge Railroad, Mesa Verde and Durango Mountain Resort reports.

<sup>2</sup> <http://www.nasa.gov/press/2014/october/satellite-data-shows-us-methane-hot-spot-bigger-than-expected/#.VD7L9NR4o-K>

<sup>3</sup> <http://www.areavibes.com/durango-co/cost-of-living/>

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Colorado in which to live.<sup>4</sup> Using this qualification, over 24% of La Plata County residents are considered low-income.

Low-income households shoulder the burden of spending a higher percentage of their income on utility bills. The U.S. Housing and Urban Development office (HUD) defines cost burden as the ratio of housing costs to household income. Costs include rent or mortgage payments, utilities, association fees, insurance, and real estate taxes. Over 7,200 La Plata County households (28% of all county houses)<sup>5</sup> have a cost burden greater than 30% or other significant housing problems<sup>6</sup>. Clean solar energy is unattainable to these families due to the upfront costs of installation, yet evidence suggests they have the greatest need for reducing their energy burden.

4CORE served low-income weatherization clients that were paying an average of \$901 per year in utility bills in 2011<sup>7</sup> and the cost of electricity has continued to rise as it has for many other communities around the nation<sup>8</sup>, increasing the need for affordable clean energy solutions for all income levels. Southwest Solar Barn-Raising will provide low-income residents with access to solar, a clean energy solution that decreases environmental risks by reducing demand for coal-fired electricity, and mitigating a principal cause of climate change while improving community climate resiliency.

The low-income population targeted will also benefit from the proposed project by the initiation of a self-sustaining program focused on eliminating barriers to solar power for this underserved demographic. Southwest Solar Barn Raising will empower citizens thru professional leadership and training on how to work together toward reducing each participant's energy burden, by installing clean solar power generation and thus become more climate resilient.

### **III. Organization's Historical Connection to the Affected Community**

4CORE was formed in 2008 by a coalition of diverse stakeholders, including representatives from local municipalities, utilities, energy companies, and other organizations and businesses with the goal of creating an organization to promote resource efficiency. The resulting nonprofit organization is a unique collaboration among local utilities, local governments, and grass root citizens' efforts. The organization has provided education, outreach and services to low-income households in the five-county region. 4CORE's mission is to serve Southwest Colorado as the leading resource for the effective and efficient use of energy to promote and sustain vibrant local communities.

As part of fulfilling this mission, 4CORE administered the Department of Energy's (DOE) Weatherization Assistance Program (a program that has existed for thirty seven years) starting in

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<sup>4</sup> "2012 Kids Count in Colorado - La Plata County Kids." Colorado Children's Campaign. Colorado Children's Campaign, 27 2012. Web. 18 Dec 2012. <http://www.ecclaplata.org/documents/2012KIDSCOUNTIAKpresentation-LaPlata-FINAL.pdf>.

<sup>5</sup> <http://quickfacts.census.gov/qfd/states/08/08067.html>

<sup>6</sup> HUD Datasets based on La Plata County:  
[http://www.huduser.org/portal/datasets/cp/CHAS/data\\_querytool\\_chas.html](http://www.huduser.org/portal/datasets/cp/CHAS/data_querytool_chas.html)

<sup>7</sup> 4CORE Energy Tracking

<sup>8</sup> <http://www.eia.gov/forecasts/steo/report/electricity.cfm>

<sup>9</sup> [http://www.fourcore.org/Portals/0/Documents/Solarize/Solarize\\_Final\\_Report\\_073114.pdf](http://www.fourcore.org/Portals/0/Documents/Solarize/Solarize_Final_Report_073114.pdf)

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2009. 4CORE provided weatherization services to low-income households in the five-county region of Southwest Colorado, including Archuleta, La Plata, Dolores, Montezuma, and San Juan counties. The program was administered and implemented by 4CORE through the Colorado Energy Office (CEO) until it was consolidated in 2013 and moved to Grand Junction by the CEO. During this tenure, 4CORE weatherized 628 homes, serving over 1,000 area residents.

In 2013, 4CORE received an EPA Environmental Justice Small Grant to increase indoor air quality in low-income households in La Plata County. The program exceeded all goals and outcomes, reaching 393 residents through 20 educational presentations and recruiting 184 households to take the Healthy Homes and/or Smoke Free Home and Car pledges, agreements to keeping their home healthier with the low and no-cost tips they received at the workshop, or avoiding smoking in their home and car for at least four weeks.

Other programs include the Sustainable Building Education Program, the Resource Smart Business Program, administration of collaborative energy efficiency rebate programs, and energy action planning for local governments.

4CORE's efforts are geared toward increasing energy awareness in the community through education and direct services. The cumulative impact has been impressive, resulting in the prevention of 5,289 metric tons of carbon pollution, \$441,000 annual utility savings, as well as vastly improved living conditions for those served, as evidenced by the fact that over 80% of the residences weatherized were found to have health and safety issues

Low-income families trust 4CORE as an agency working to improve their lives, while simultaneously strengthening the sustainability of the community as a whole. 4CORE strives to maintain an ongoing relationship with participants in all of its programs through an informative and educational monthly newsletter, as well as through ongoing public awareness advertisements in local papers.

In 2013 and 2014, 4CORE facilitated Solarize La Plata, a grassroots program that resulted in 101 new solar arrays throughout La Plata County capable of producing 522 kilowatts (kW) and reducing an estimated 14,175 metric tons of carbon pollution over the next 25 years. 4CORE recruited volunteers from the community to form a Steering Committee, comprised of residents and business members. This volunteer committee played the lead role in decision-making and took ownership of the effort, making decisions on cost, installation, and outreach for the program<sup>9</sup>. Solarize La Plata garnered commendations from the Department of Energy and other communities around the nation.

These 4CORE programs give the organization experience with fulfilling objectives of the Clean Air Act by reducing indoor air pollution in homes, improving health of families, significantly increasing indoor air quality awareness in the community, and preventing carbon pollution from coal-fired power plants. The momentum generated from these highly successful programs will be used as a catalyst to engage affected community members in the Southwest Colorado Solar Barn-Raising.

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<sup>9</sup> [http://www.fourcore.org/Portals/0/Documents/Solarize/Solarize\\_Final\\_Report\\_073114.pdf](http://www.fourcore.org/Portals/0/Documents/Solarize/Solarize_Final_Report_073114.pdf)

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#### **IV. Project Description**

##### **i) Description of Activities**

The goal of Southwest Solar Barn Raising is to reduce the public health risks stemming from non-renewable sources of power and creating pathways to renewable power sources for low-income families. The program will achieve these results through a comprehensive education and installation campaign to empower low-income households through a deeper understanding of the benefits of renewable energy and demonstration projects that will prevent further carbon pollution. The design of the program will allow for it to continue into the future beyond the conclusion of the grant by implementing a model premised upon volunteer community engagement.

A Steering Committee consisting of solar experts and representatives of the affected community will achieve the following outputs by 2016:

- Engage and educate 300 residents about the benefits of solar.
- Develop a replicable, sustainable model for securing solar for low-income households.
- Create a pool of volunteer labor for future Solar Barn Raising Projects by asking each recipient family to ‘pay it forward’ by contributing 16 hours of volunteer labor to a future installation on another family’s home.

##### **Outcomes include:**

- Prevent 915 metric tons of carbon pollution over the next 25 years, contributing to climate resiliency through the prevention of future greenhouse gases.
- Provide solar to ten (10) low-income families, offsetting at least 75% of their electricity costs. This will lead those households to become more climate resilient by lessening their utility cost burden that is likely to increase as a result of increasing temperature extremes, and the rising costs of electrical distribution.

4CORE will facilitate the formation of a Steering Committee consisting of representatives of the affected community, and individuals with expertise as engineers, electricians, builders, and process management to lead the Solar Barn Raising Campaign. Following the Solarize La Plata model, the Steering Committee will work to build consensus, set community priorities and further define campaign parameters including system size, household eligibility criteria, system design specifications, recruitment and procedural protocol.

4CORE and the Solar Barn Raising Steering Committee will conduct an informational campaign about the benefits of the ‘first reduce, then produce’ strategy. Though served with energy-reducing measures, targeted households do not currently have access to solar power or information on the benefits of reducing energy use as it relates to air pollution. The informational campaign will convey energy efficiency and renewable energy as it relates to the Clean Air Act, Section 103(b)(3) and activities to prevent and control air pollution. The proposed project will abide by the following timeline with listed milestones:

1. **First quarter:** The focus of the first quarter will be the creation of the outreach plan and educational presentation. At this time, corporate sponsors will be approached and

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- secured. Volunteers and low-income families will be recruited during this time in collaboration with project partners. Collateral, social media schedule, targeted advertisements in strategic locations, and the agenda for educational barn raising sessions will all be developed during this time. Campaign launch will commence toward the end of the first quarter.
2. **Second quarter:** Campaign promotion and four educational sessions in conjunction with solar installations will be offered during the second quarter.
  3. **Third quarter:** Campaign promotion and four educational sessions in conjunction with solar installations will be offered during the third quarter.
  4. **Fourth quarter:** Campaign promotion and two educational sessions will be offered during the fourth quarter, for a total of *ten educational sessions in conjunction with solar installations*. After all installations have been completed, a mailed survey to participants will be conducted, compiled and analyzed to measure the effectiveness of the project.

Families that have already undergone energy efficient modifications or construction will be recruited for the program. By working with housing related non-profits in La Plata County, including Housing Solutions for the Southwest and Habitat for Humanity, the Solar Barn Raising Steering Committee will identify energy efficient low-income households as potential candidates for solar PV systems. The benefit of working with these housing related non-profits is that they have already provided energy efficient construction or weatherization upgrades to households qualified as being low-income (at or below 200% of the federal poverty level). This element will be critical as it is not cost effective to power a home with renewables if it has not already undergone energy saving upgrades.

Each one of the ten qualified households receiving a solar PV system will have corporate sponsors associated with it. Solar suppliers, manufacturers and installers will be recruited to donate equipment and local corporate sponsors will provide cash to purchase remaining equipment and cover overhead costs.

Volunteers from sponsoring companies, the general public, as well as home owners who are program candidates will be recruited to conduct installation of panels, culminating in a highly publicized workday, providing recognition for the sponsor and the program. To qualify for the program, each household receiving solar will agree to volunteer 16 hours for a future installations, resulting in a pool of volunteers to perpetuate the program into the future once grant funding is complete.

To ensure program goals and outcomes are achieved, all participating partners in the Solar Barn Raising Program will receive a follow-up survey to track the impact of the project, and the Program Manager will compile and evaluate these to measure the effectiveness of the project. Survey questions will be quantitative and qualitative in nature.

### ii) Partnerships

4CORE and the Solar Barn Raising Steering Committee will conduct outreach efforts by working with partner agencies Regional Housing Alliance of La Plata County, La Plata County

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Habitat for Humanity, and Housing Solutions for the Southwest to identify and recruit from their client bases qualified households that will benefit from the proposed project. 4CORE will conduct outreach to low-income housing project managers to coordinate presentations to as many low-income residents as possible. Additionally, the partner agencies will assist in the promotion of the 'first reduce, then produce' informational campaign via constituent newsletter, email blasts, as well as other promotional methods.

These organizational services bridge the need for human resources and housing services, offering an ideal starting point for clients who would benefit most from solar power. These groups have built energy efficient homes, provided weatherization services, or facilitated loan programs for low-income home owners. Additionally, the partner agencies provide a line of communication and will assist in promotion of the Southwest Solar Barn Raising Program via constituent newsletters, email blasts, classes, and/or other promotional methods.

**Housing Solutions for the Southwest (HSSW)** is a Southwest Colorado non-profit agency providing a variety of housing services to low-income residents in Southwest Colorado. HSSW is a subcontractor for the Weatherization Assistance Program, providing a trained and certified weatherization crew. The history of their partnership with 4CORE includes collaborating to meet weatherization production goals for the region.

**Habitat for Humanity of La Plata County (HFHLPC)** is an affiliate of Habitat for Humanity International. As an independent, locally run nonprofit 501(c)(3) organization HFHLPC helps families of low and moderate incomes become homeowners by building and partnering in the creation of affordable, energy efficient housing. The Habitat for Humanity of La Plata County is proud to be a local builder for 20 years, constructing 39 affordable homes since 1994.

**The Regional Housing Alliance (RHA)** is a local government agency formed in 2004 to address affordable housing needs for La Plata County. In essence, RHA functions as a shared housing department for La Plata County, the City of Durango, and the Towns of Ignacio and Bayfield. RHA is the only housing agency providing affordable housing programing to the local workforce with incomes between 50-125% of area median income (\$30,000-\$80,000). 4CORE and RHA have collaborated since 2011 through RHA's Homebuyer Education Program with 4CORE sharing energy efficiency information with prospective homebuyers, as they prepare to become homeowners. Additionally, 4CORE and RHA have collaborated on ways to add green building design to RHA's sponsored developments.

All of these partners have a vested interest in seeing the homes they have served continue to provide safe, affordable housing to their clients. The connection between reducing their client's dependence on coal-fired, increasingly expensive electricity is evident and the Southwest Solar Barn Raising Program would bring positive publicity and awareness to their extensive accomplishments. 4CORE is committed to preventing overlap between partnering agencies, and a project of this nature would help to distinguish each partner's niche and highlight the benefits of their services for low- and moderate-income residents.

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4CORE has a strong track record for excellence in communication, recognition of partner contributions, and receptiveness to feedback. 4CORE's collaborative history with these partner organizations demonstrates 4CORE's ability to maintain and sustain partnerships.

An example of such a partnership includes 4CORE's previous work with Housing Solutions for the Southwest and Southwest Conservation Corps (SCC) to form the Southwest Weatherization Collaborative (SWC). The agencies worked in tandem in a unique approach to implement the Department of Energy's Weatherization Assistance Program in Southwest Colorado. This model delivered high quality services, improved oversight, and provided excellence in training by blending experience with an apprentice model that engaged local young adults. The shift in focus from individual organizational success to the greatest benefit for the entire community used the strengths and abilities of individual non-profits to respond to the community's need for low-income weatherization and job training.

The methods used to sustain these partnerships will continue to be used moving forward and the Southwest Solar Barn Raising Program will enhance these partnerships through the successful implementation of another beneficial community program.

### **V. Organizational Capacity and Programmatic Capability**

4CORE has significant organizational and administrative capacity and experience to manage, expend and account for Federal funds. Since 2008 4CORE has administered ten Federal grants through state and local governments with award amounts ranging from \$8,000 to \$2.8 million dollars. Awards include the Department of Energy (DOE) Weatherization Assistance Program funding allocated through the Colorado Energy Office, in addition to two EPA grants.

4CORE is a sub-recipient of the collaborative EPA Climate Showcase Communities grant awarded to La Plata County in April 2011. In addition to implementing our own section of this program's work plan, 4CORE is responsible for oversight and management for the program activity and reporting for nine sub-sub recipient organizations. 4CORE has met all reporting requirements to La Plata County in a timely manner. Robyn DeYoung is the EPA Project Officer and the Assistance ID is AF-83494101-0.

4CORE was also a recipient of the EPA Environmental Justice Small Grant in 2012. Progress and finances were tracked and submitted in a timely fashion as progress reports. 4CORE recently completed this grant, submitting all progress reports and financial statements in a complete, timely manner to April Nowak, EPA Project Officer for Assistance ID is EPA-OECA-OEJ-15-01, which funded the 4CORE Healthy Homes Project.

4CORE completely, accurately, and systematically accounts for all funds received, pursuant to generally accepted accounting principles and 4CORE's internal policies and procedures regarding sound financial management utilizing QuickBooks Pro 2010 and Microsoft Excel. 4CORE's internal fiscal management policies and procedures insure that all funds received are safeguarded and appropriately managed, expended, and accounted for by fund pursuant to cost allocations and tied to budget projections.



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Monthly organization financial reports are prepared for and reviewed by 4CORE's Executive Director and Board Treasurer who further report to the Board of Directors. Specific fund financials are prepared monthly for review by appropriate Program Managers and for reporting to funders to assure the program is on track to meet budgeted deliverables. 4CORE has completed four A-133 single comprehensive financial audits with no significant findings (audits are available for viewing at the 4CORE website: [www.fourcore.org](http://www.fourcore.org)).

4CORE diligently complies with the extensive reporting requirements for all funds meeting all deadlines and program objectives. 4CORE has been approached by La Plata County to manage additional awards as a direct result of the level of performance achieved by 4CORE for the EPA CSC grant.

### **VI. Qualifications of the Project Manager (PM)**

Teresa Shishim, 4CORE Program Manager, has over ten years of project and program management experience. She has successfully managed educational programs, outreach campaigns, events, and community projects. She uses her experience collaborating with a diverse-array of stakeholders, coordinating hundreds of volunteers, and educating constituents with traditional media and social networking to reduce carbon pollution one pound at a time.

Ms. Shishim has lived in the community and worked with the partners listed above for the last five years. She has given multiple educational presentations including energy efficiency presentations to the RHA Homebuyers classes for the past two years. Ms. Shishim has also coordinated weatherization grant applications and programs with HSSW for low-income residents.

Additionally, Ms. Shishim facilitated and managed the nationally recognized Solarize La Plata Program. Her responsibilities as the program manager included coordinating clients, stakeholders and empowering volunteer committee members in the creation of a paradigm shifting renewable resources program. Ms. Shishim considers her work with Solarize La Plata as one of the highlights of her career, as the results of the program are mitigating climate change through the reduction of demand for 822,399 kilowatt hours of coal-fired electricity per year and the creation of pathways for more solar installations months after the program's completion.

### **VII. Past Performance in Reporting on Outputs and Outcomes**

In addition to the Climate Showcase Communities and 2012 EPA Environmental Justice Small Grants detailed above, 4CORE has demonstrated competent and diligent administration of the Department of Energy Weatherization Assistance Program, CFDA 810420, \$3,818,617 (2009-2013), administered by the Colorado Energy Office (CEO) by Douglas Karl.

Additional experience includes receiving, managing and effectively fulfilling requirements for the ARRA ENERGY STAR New Homes Program, CFDA 810410, \$25,000, administered by Peter Rusin at the CEO, and the ARRA Community Energy Coordinator Energy Efficient Conservation Block Grant, CFDA 811280, \$265,000, administered by Angie Fyfe at the CEO.

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With each funded program, 4CORE documents progress with continual analysis of established metrics and comparisons to actual vs. planned milestones. This information is compiled in an annual report each year<sup>10</sup>.

In addition, past programs administered by 4CORE involve participants who receive a follow-up survey to track the impact of 4CORE activities. The Program Manager compiles and evaluates these to measure the effectiveness of the project. The Solarize La Plata Campaign was summarized in a report of this nature<sup>11</sup>.

### **VIII. Quality Assurance Project Plan (QAPP) Information**

It is believed that the proposed project would require a Quality Assurance Project Plan. Since an aspect of the proposed project involves using existing computer databases containing personal information, it seems likely that a QAPP will be necessary.

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<sup>10</sup> All existing 4CORE annual reports are available at <http://www.fourcore.org/AboutUs/MinutesandReports.aspx>

<sup>11</sup> <http://www.fourcore.org/Residential/Solarize.aspx>